

### **ABSTRACT**

The present invention provides structures and methods that allow polymers of any length, including nucleic acids containing entire genomes, to be stretched into a long, linear  
5 conformation for further analysis. The present invention also provides structures and methods for selecting and stretching polymers based on their lengths. Polymers are loaded into a device and run through the structures. Stretching is achieved by, *e.g.*, applying shear forces as the polymer passes through the structures, placing obstacles in the path of the polymer, or a combination thereof. Since multiple molecules may be stretched in  
10 succession, extremely high throughput screening, *e.g.*, screening of more than one molecule per second, is achieved.

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